Riverside Industrial Park Superfund Site

Newark, New Jersey

Superfund Proposed Plan July 2020

PURPOSE OF THE PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the Riverside Industrial Park Superfund Site (Site or Riverside Industrial Park), identifies EPA's Preferred Alternative for this Site, and provides the basis for this preference. This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA) in consultation with the New Jersey Department of Environmental Protection (NJDEP). EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of the contamination at the Site and the remedial alternatives summarized in this Proposed Plan are described in the April 2020 Remedial Investigation (RI) report and July 2020 Feasibility Study (FS) report, respectively, both of which are available in the administrative record file. EPA and NJDEP encourage the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted at the Site.

This Proposed Plan is being provided to inform the public of EPA's Preferred Alternative and to solicit public comments pertaining to all the remedial alternatives evaluated, including the Preferred Alternative. The Preferred Alternative consists of the following alternatives: Waste Alternative 2 – Removal and Off-Site Disposal; Sewer Water Alternative 2 – Removal and Off-Site Disposal; Soil Gas Alternative 2 – Institutional Controls[1], Air Monitoring or Engineering Controls (in existing occupied buildings), and Site-Wide Engineering Controls (for future buildings); Soil/Fill Alternative 4 – Institutional Controls, Engineering Controls, Focused Removal with Off-Site Disposal of Lead, and Non-Aqueous Phase Liquid (NAPL)[2] Removal; and Groundwater Alternative 4 – Institutional Controls, Pump and Treat, and Targeted Periodic In-Situ Remediation.

MARK YOUR CALENDAR

July 22, 2020 – August 21, 2020: Public comment period related to this Proposed Plan.

August 5, 2020 at 7:00 P.M.: Virtual Public meeting. One may find meeting-participation details using the following link: (website link)

Alternately, one may participate by telephone using the following conference line number: (phone number). Please register in advance of the virtual meeting by accessing: (website link) or emailing Shereen Kandil, Community Involvement Coordinator, at: Kandil.Shereen@epa.govor calling her at (212) 637-4333.

Anyone interested in receiving materials for the public meeting in hard copy should either email or call Ms. Seppi with such a request by Friday, April 17.

The Administrative Record (supporting documentation) for the site is available at: [HYPERLINK "http://www.epa.gov/superfund/riverside-industrial"]

And at the following information repository:

USEPA-Region 2
Superfund Records Center
290 Broadway, 18th Floor
New York, NY 10007-1866

EPA, in consultation with NJDEP, may modify the Preferred Alternative or select another alternative presented in this Proposed Plan based on new information, additional data, or public comments. Therefore, EPA is soliciting public comment on all the alternatives considered in the Proposed Plan and in the detailed analysis section of the FS report. The final decision regarding the selected remedy will be made after EPA has reviewed and considered all information submitted during the public comment period.

[1] Institutional controls are non-engineered controls, such as property or groundwater use restrictions, placed on real property by recorded instrument (such as deed modifications) or by a governmental body by law or regulatory activity for reducing or eliminating the potential for human exposure to contamination and/or protecting the integrity of a remedy.

[2] NAPLs are liquid contaminants that do not easily mix with water and remain in a separate phase in the subsurface. They can potentially migrate independently of groundwater and remain as a residual source of groundwater or soil contamination.

COMMUNITY ROLE IN SELECTION PROCESS

EPA and NJDEP rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI and FS reports and other related information in the administrative record file, and this Proposed Plan, have been made available to the public for a public comment period that begins on **July 22, 2020** and concludes on **August 21, 2020**.

A virtual public meeting will be held during the public comment period at (web link) on **August 5, 2020** at 7:00 p.m. to present the conclusions of the RI/FS, explain the Proposed Plan and the alternatives presented in the FS, and to receive public comments.

Oral and written comments received at the public meeting, as well as written comments received during the public comment period, will be summarized and responded to by EPA in the Responsiveness Summary section of the Record of Decision (ROD), the document that formalizes the selection of the remedy.

Written comments on the Proposed Plan should be addressed to:

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SITE BACKGROUND

Site Description

The Site is currently a 7.6-acre partially active industrial park known as the Riverside Industrial Park located in the North Ward community of the City of Newark, Essex County, New Jersey. PPG Industries, Inc. (PPG) and its predecessors occupied the Site and conducted paint and varnish manufacturing operations there from approximately 1902 until 1971. After 1971, the Site was subdivided into 15 parcels/lots, and is now identified as the Riverside Industrial Park.

Both Riverside Avenue and McCarter Highway border the Site to the west along with a segment of railroad track adjacent to McCarter Highway. Currently, the central and northern portions of the Site contain active industrial/commercial businesses, operating in buildings formerly operated by PPG for paint manufacturing, while the south side of the Site contains mostly vacant, former PPG buildings. The main entryway is through a vehicle access point on Riverside Avenue; however, pedestrian trespassing occurs regularly through unsecured portions of the Riverside Industrial Park. Much of the Riverside Industrial Park surface area is covered by buildings or pavement. The Passaic River and its tidal mudflat border the Site on the east side. Sections of steel, concrete, and wooden bulkhead provide a retaining wall along most of the Site adjacent to the Passaic River; however, the bulkhead has fallen into disrepair in some locations and several sections of the wooden bulkhead have collapsed.

There are 14 existing buildings at the Site with five of the buildings being vacant (Buildings #6, #7, #12, #15, and #17) (Figure 1). At the time of the remedial investigation, Buildings #1, #2, #3, #9, #10, #13, #14, and #16 had ongoing business operations, and a small garage building (Building #19) was used for storage by the occupant of Building #13. Remnants of Buildings #4 and #5 are present at the Site; a fire in 1982 caused significant damage and resulted in the buildings being partially demolished.

Site History

The majority of the Site was reclaimed from the Passaic River with imported fill between 1892 to 1909. The origin of the fill material is unknown, but it consists mainly of sands, silts, gravel, and man-made materials, such as brick, glass, concrete block, wood, and cinders. The fill material may have been contaminated prior to placement at the Site and was further impacted by accidental spills, illegal dumping, improper handling of raw materials, and improper waste handling/disposal from subsequent industrial and commercial activities conducted at the Site.

PPG manufactured paint, varnish, linseed oil, and resins at the Site from approximately 1902 until 1971. The original paint plant was constructed in the early 1900s by the Patton Paint Company, which merged into the Paint and Varnish Division of Pittsburgh Plate Glass Company in 1920, which has been known as PPG since 1968. PPG mixed resins, solvents, and metal pigments (including Lead) to produce paints. Varnishes were made from resins, oils, and solvents.

Following the closure of PPG's operations in 1971, the property was subdivided into 15 lots, and since that time a wide variety of industrial and manufacturing companies have operated intermittently at the Site under various owners. Occupants and operations have included the following:

- Frey Industries, Inc./Jobar for warehousing,

packaging, repackaging, and distribution of client-owned chemicals
- Baron Blakeslee, Inc. for product distribution, warehousing of a variety of chemical products, analysis of various chemical blends and waste samples, drum storage, and truck and tanker parking
- Universal International Industries for various manufacturing operations
- Samax Enterprises for chemical manufacturing
- HABA International, Inc./Davion Inc. for manufacturing nail polish remover and related products, and Acupak, Inc. for providing packaging services for HABA
- Roloc Film Processing for manufacturing foils utilized in various commercial products
- Gilbert Tire Corporation for storing used tires and wheel rims
- Chemical Compounds, Inc./Celcor Associates, LLC for manufacturing hair dyes and other personal hygiene products
- Teluca for packaging and distributing hair dyes, hair color, and related ingredients, hair dye research laboratory, offices, and warehousing
- Gloss Tex Industries, Inc. for manufacturing bulk nail enamel, lacquer, and related cosmetic products
- Ardmore, Inc. for manufacturing soaps and detergents, and storing their empty drums
- Monaco RR Construction Company for storing railroad rails, cross ties, and spikes
- Federal Refining Company for recycling metal
- Midwest Construction Company for storing and maintaining construction equipment and materials

Historic site operations, accidental spills, illegal dumping, improper handling of raw materials, and/or improper waste disposal are among the causes of the current soil and groundwater contamination at the Site.

In 2009, EPA and NJDEP responded to an oil spill that was discharging from a pipe into the Passaic River. The pipe was traced back to two basement tanks located in a vacant building on Lot 63 (Building # 7). Since the tanks revealed contained several hazardous substances, EPA initiated an emergency removal action to stop the discharge and remove the source material. Further EPA investigation of Lots 63 and 64 led to the discovery of several 12,0000-15,000 gallon underground storage tanks (USTs) adjacent to Building #7, numerous 3,000-10,000 gallon aboveground storage tanks (ASTs), an underlain concrete basement/impoundment, a number of 55-gallon drums, and pigment hoppers and other smaller containers in Buildings #7 and #12. Between 2011 and 2014, EPA performed a removal action to address these conditions on Lots 63 and 64. EPA's Removal Action activities included: removal of the liquids from the basements of Buildings #7 and #12; investigation of the USTs with removal of two of them; investigation and disposal of the ASTs, drums, and smaller containers; and soil, groundwater, and waste sampling.

In 2014, after the conclusion of the EPA's Removal Action. PPG signed an Administrative Settlement Agreement and Order on Consent (ASAOC) with EPA to complete the RI/FS for the Site. The RI was completed in April 2020 and the FS was completed in July 2020. The RI and FS and other related information in the administrative record file provide the basis for this Proposed Plan.

Prior to the start of the RI in 2017, at least seven lots at the Site were subject to Industrial Site Recovery Act (ISRA) remediation under New Jersey state law. The ISRA investigations resulted in institutional controls on these properties with either modified deed notices for engineering controls (such as pavement surface cover) or groundwater Classification Exception Areas (CEAs) to restrict use of contaminated groundwater. RI sampling was conducted site-wide and was not restricted by these State institutional controls.

SCOPE AND ROLE OF ACTION

Site remediation activities are sometimes segregated into different phases, or Operable Units (OUs), so that remediation of different aspects of a site can proceed separately. The entire Site is designated as OU1, and it is expected to be the only OU for the Site. This Proposed Plan describes EPA's preferred remedial action for OU1, which addresses contaminated soil, soil gas, sewer water, and groundwater present at the Site. This Preferred Alternative also addresses various wastes found across the Site.

SITE HYDROGEOLOGY

The majority of the Site was reclaimed from the Passaic River with imported fill. The fill is up to 15 feet (ft) thick and primarily consists of sands mixed with silts. Beneath the fill is the former riverbed, which is primarily silt. Underlying deposits include glacial deposits of gravel and sand, followed by lake deposits consisting of silts, and ultimately bedrock.

Two groundwater units were investigated during the RI.

The "shallow unit" represented groundwater at depths less than 12 feet below ground surface (bgs) in the fill material whereas the "deep unit" represented groundwater below the former riverbed at approximately 25 feet bgs.

The primary groundwater flow direction in both the shallow and deep units is east toward the Passaic River. Both the shallow and deep groundwater units at the Site are influenced by tidal changes, which are greatest in areas adjacent to the river. The tidal influence appears to be greater in the northern portion of the Site compared to the southern portion.

RESULTS OF THE REMEDIAL INVESTIGATION

The RI was conducted in two phases of work from 2017 through 2019. Soil, shallow and deep groundwater, indoor air, water and solids in sewer lines, sump pumps, bulkhead pipes, and miscellaneous abandoned containers were all sampled to define the nature and extent of contamination at the Site. Based on the results of the RI, EPA identified several concerns and organized them into the five categories of media below:

- Wastes. This media includes light non-aqueous phase liquid (LNAPL)[3] in Building #15A, USTs containing LNAPL and an aqueous solution on Lot 64, the NAPL-impacted soil/fill material surrounding the USTs, and several containerized waste in abandoned buildings.
- Sewer Water. This media includes water and solids with elevated concentrations of chlorinated organic chemicals in an inactive manhole.
- Soil Gas. The concentrations of volatile organic compounds (VOCs) in the soil/fill material may impact the quality of indoor air due to vapor intrusion.
- Soil/Fill. This media was found to be impacted by several contaminants. These generally included metals, polychlorinated biphenyls (PCBs), VOCs, and semi-volatile organic compounds (SVOCs).
- Groundwater. This media was also found to be impacted by several contaminants, which generally include metals, VOCs, and SVOCs.

EPA is also working in conjunction with NJDEP to address unregulated discharges to the Passaic River from a pipe along the bulkhead on Lot 57. See discussion on Lot 57 below for more information.

Each of the media mentioned above are discussed in more detail in the following sections of this Proposed Plan. Due to the extensive number of contaminants found at the Site, the following discussion focuses only on the most prominent contaminants in each medium. Furthermore, contaminants not discussed in this Proposed Plan are typically co-located with those that are discussed. Additional information can be found in the RI Report.

Waste

The primary focus of this medium is the LNAPL in Building #15A, the USTs containing LNAPL and an aqueous solution on Lot 64, the NAPL-impacted soil/fill material surrounding the USTs, and several wastes in abandoned buildings. There are a limited number and small volume of waste containers found in Buildings #7, #12, and #17. These containers were not associated with current operations, and the contents are not characterized as hazardous wastes for disposal purposes under the Resource Conservation and Recovery Act (RCRA). However, based on RI sampling, there are some constituents within the wastes that are hazardous, such as, chromium or lead and there is potential for contaminants to be released into the environment. Within Building #7, a white chalky talc-looking substance remains in an approximately 5-foot diameter hopper. The top of the hopper is accessible from the second floor, and the chalky contents are visible approximately 5 feet below the top. The estimated volume of solid waste in the hopper is approximately 11 cubic yards (CY). In Building #12, a plastic 55-gallon drum contains approximately 50 gallons of liquid waste. In Building #17, a five-gallon bucket labeled as a filler contains a solid waste.

Six USTs were identified in a tank field north of Building #12 on Lot 64. One UST was found to contain 1,600 gallons of LNAPL, which was characterized as diesel/heating oil. Approximately 3,500 CY of NAPL-impacted soil/fill material is surrounding the USTs. All six USTs contained liquid that was sampled, and the results found that none of the UST liquid was classified as a hazardous waste for disposal purposes under RCRA. Each tank measured approximately 30 feet long by 8 feet in diameter, and they contained a combined volume of 34,700 gallons of liquid. While the liquid is considered non-hazardous for waste disposal, the liquid contains primarily VOCs and chlorinated VOCs. The same VOCs found in the USTs were also reported in nearby groundwater wells. The tank contents are a potential source of soil and groundwater contamination.

[3] LNAPLs is a type of NAPL where liquid contaminants do not easily mix with water and they are less dense than water. This means that LNAPL is generally found at the top of the water table.

A portion of Building #15A also contains LNAPL in pooled water under a steel grated floor. The LNAPL is approximately 0.5-foot to 0.65-foot thick and very viscous. Assuming that the grate and liquid underlies the entire floor area (approximately 650 square feet), and assuming an average thickness of 0.6-foot, the volume of LNAPL in Building #15A is estimated at 2,900 gallons. Based on RI laboratory results, the LNAPL is characterozed as diesel fuel/heating oil.

Sewer Water

The RI included an investigation of the sewer system at the Site, which involved collecting samples from manholes across the Site. Sampling results for water and solids collected from an inactive manhole on Lot 1 (identified in the RI as Manhole #8) found methylene chloride and trichloroethylene (TCE). The sewer at this location was determined to be as inactive based on observations of no flow and because there are no current users upstream of the location. Although there is currently no flow within the sewer lines on the Site, there is potential for contaminants to be released into the environment. Other portions of the sewer system on the Site were not identified as potential sources of contamination to groundwater or soil/fill.

Soil Gas

Following the initial two rounds of groundwater sampling, the shallow groundwater results were screened against NJDEP vapor intrusion screening levels (VISLs). This comparison suggested that vapor intrusion may be a potential exposure risk. Since a potential risk was found, indoor air sampling was conducted in 2019 within occupied buildings of the Site (Buildings #1, #2, #3, #9, #10, #14, and #16). Additionally, three exterior ambient air samples were collected to determine potential background concentrations near the occupied buildings. Some VOCs were found in indoor air samples, but it was determined that they did not pose unacceptable risk to occupants of the currently occupied buildings. However, based on modeling using soil and groundwater data, an unacceptable risk may be posed to occupants in future buildings. The risk drivers were naphthalene, TCE, and total xylenes in soil/fill material.

Soil/Fill

A significant sampling regime was conducted to analyze the nature and extent of contamination in soil/fill material. Over 100 soil borings and a total of 210 soil samples were collected across the Site.

The RI identified a NAPL-impacted soil/fill material in several soil borings east and south of the USTs on Lot 64. Isolated areas of NAPL-impacted soil/fill material were also observed in the soil/fill material during the drilling of a monitoring well on Lot 63. However, monitoring wells in this area of the Site did not have a measurable thickness of LNAPL in the groundwater. The sources of the NAPL-impacted soil/fill material on Lots 63 and 64 are likely releases from the USTs or illegal dumping.

Of all the contamination at this Site, lead is one of the primary contaminants of concern. A significant amount of lead contamination was found in soil/fill material on Lots 63 and 64 around Building #7. Elevated lead (at concentrations that exceeded the NJDEP Non-Residential Direct Contact Soil Remediation Standard (NRDCSRS) of 800 mg/kg) was also found on Lots 1, 57, 58, 61, 65, 67, 68, 69, and 70. Copper and arsenic were also metals identified as a concern in the RI, and they were found to be primarily co-located with lead in soil on Lot 63.

The VOCs that were identified at the Site include benzene, naphthalene, vinyl chloride, TCE and total xylenes. The highest chlorinated VOC soil sampling results were from Lot 68, where a chlorinated solvent release is known to have occurred, and on Lot 64, adjacent to the USTs. Benzene, naphthalene, and vinyl chloride concentrations exceeded NJDEP NRDCSRS on Lots 62, 64, and 68. Note that naphthalene may be reported as a VOC or SVOC.

SVOCs of concern at the Site are a group of chemicals known as polycyclic aromatic hydrocarbons (PAHs). Benzo(a)pyrene was the most prevalent PAH across the Site, with concentrations exceeding the NJDEP NRDCSRS of 2 mg/kg on Lots 1, 57, 60, 61, 62, 63, 64, 66, 67, and 69. The other three PAH compounds of concern (including benzo[a]anthracene, benzo[b]fluoanthene, and dibenzo[a,h]anthracene) had elevated concentrations that exceeded the NJDEP NRDCSRS on Lot 63 adjacent to known NAPL-impacted soil and on Lot 67.

Total PCB Aroclor concentrations exceeded the NJDEP NRDCSRS of 1 mg/kg on Lots 57, 64, 65, 67, and 70.

Groundwater

The RI characterized the nature and extent of groundwater contamination beneath the Site. To conduct this characterization, 31 monitoring wells were installed sample the shallow groundwater unit (also referred to as the shallow fill unit) and five monitoring wells were installed to sample the deep groundwater unit. Note that groundwater characterization was done site-wide and not by lot as was done with the soil characterization, but lot numbers or building numbers were used to help identify the location of the contamination and the sources.

At this Site, groundwater is designated by NJDEP as a Class IIA aquifer, which means that this groundwater may be a source of potable water (e.g., drinking water). However, the groundwater is not currently used for potable water and is not reasonably expected to be used as a potable source in the future because the Site and surrounding area are served by the City of Newark's potable water system, and the site-specific conductivity readings of the groundwater indicate possible brackish conditions.

Shallow Groundwater Unit

Several VOCs were detected throughout the shallow groundwater unit (also known as the shallow fill unit) at levels that exceeded the NJDEP Class IIA standards. Benzene, toluene, ethylbenzene, and total xylenes (also known as BTEX) were the most common VOCs detected in the shallow groundwater unit and are indicative of petroleum impacts to the groundwater. BTEX was primarily found in the UST area on Lot 64, extending east/southeast onto Lot 63 downgradient of the UST area. It was also found in a well adjacent to Building #15 on Lot 58. Chlorinated VOCs (including methylene chloride, tetrachloroethylene (PCE), TCE, and vinyl chloride) were primarily detected in monitoring wells on Lots 63 and 64 surrounding the USTs. The source of these chlorinated VOC is likely the UST, which also contain elevated levels of chlorinated VOCs.

SVOC (including 1,4-Dioxane) and PAH compounds (including 2-methylnaphthalene, benzo[a]anthracene, benzo[b]fluoranthene, and indeno(1,2,3-cd)pyrene) were also present in the shallow groundwater unit at concentrations that exceed the NJDEP Class IIA standards. The PAH compounds were primarily detected in groundwater monitoring wells located within the vicinity of NAPL-impacted soils and where BTEX was also detected. 1,4-Dioxane exceedances were wide-spread across the Site, primarily focused on the eastern side of the Site.

Lead in groundwater was generally located in two areas: one area is on Lots 63 and 64, and the second area is north of Building #1 along the eastern and northern property boundaries. Lead concentrations in the shallow groundwater unit exceeded NJDEP Class IIA standards in wells located on Lots 57, 60, 61, 63, 64, 66, and 67.

As previously mentioned, while NAPL-impacted soil/fill material was observed in the UST area of Lot 64, measurable LNAPL was not observed in a shallow monitoring well. Furthermore, no dense non-aqueous phase liquid (DNAPL) was observed in the RI monitoring wells.

Deep Groundwater Unit

The deep groundwater unit had five sampling wells, with two wells in the northern portion of the Site and three in the southern portion.

Fewer VOCs were detected in the deep groundwater relative to the shallow groundwater unit. Benzene, PCE, 1,1,2,2-Tetrachloroethane, and 1,1,2- trichloroethane (TCA) were the most common VOCs detected in the deep groundwater. These VOC exceeded NJDEP Class IIA standards on Lot 63 and Lot 64, and on Lot 58 near Building #15.

For SVOCs, Benzo[a]anthracene and 1,4-Dioxane concentrations in the deep groundwater exceeded NJDEP groundwater standards on Lot 63 and Lot 64, and on Lot 57 near Building #10.

Lead and PCBs were not identified as a concern in the deep groundwater in the RI. LNAPL was not observed in any deep monitoring wells.

Lot 57: Discharge to the River

Ex. 5 Deliberative Process (DP)

PRINCIPAL THREATS

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the

WHAT IS HUMAN HEALTH RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. The following four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the site in various media (i.e., soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health hazards, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals can cause both cancer and non-cancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 1x10-4 cancer risk means a "one in ten thousand excess cancer risk;" or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 1x10-4 to 1x10-6, corresponding to a one in ten thousand to a one in a million-excess cancer risk. For non-cancer health effects, a "hazard index" (HI) is calculated. The key concept for a non-cancer HI is that a threshold (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10-6 for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10-4 cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as COCs in the ROD.

characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, LNAPLs in groundwater may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element. For this Site, LNAPL in the UST on Lot 64, LNAPL in Building #15A, and the NAPL-impacted soil/fill on Lot 63 and Lot 64 are considered to constitute a principal threat waste due to it mobility and potential impact to groundwater.

SITE RISKS

A baseline human health risk assessment (BHHRA) was conducted to evaluate cancer risk and noncancer health hazards posed by exposure to Site-related contaminants. The BHHRA was conducted in the absence of remedial actions or controls (see the "What is Human Health Risk and How is it Calculated?" textbox, to the right).

A screening-level ecological risk assessment (SLERA) was also conducted to evaluate the potential for adverse ecological effects from exposure to Site-related contamination (see the "What is Ecological Risk and How is it Calculated?" textbox, below). The BHHRA and SLERA results are discussed below.

The waste material and inactive sewer material were not evaluated in the BHHRA or SLERA. However, a remedial action is being taken to address these media to remove a principal threat waste and to prevent an unacceptable release of hazardous contaminants to the environment.

Baseline Human Health Risk Assessment

EPA follows a four-step human health risk assessment process for assessing site-related cancer risks and noncancer health hazards. The four-step process is comprised of: Hazard Identification, Exposure Assessment, Toxicity Assessment, and Risk Characterization (see adjoining box "What is Risk and

How is it Calculated" for more details on the risk assessment process).

The BHHRA began with selecting COPCs in the various media that could potentially cause adverse effects from exposure. COPCs were selected by comparing the maximum detected concentration of each chemical with a risk-based screening level for the specific medium. COPCs were identified for each of the 15 Lots; seven occupied (Lots 1, 57, 59, 60, 62, 69, and 70) and eight vacant (Lots 58, 61, 63, 64, 65, 66, 67 and 68). Due to the variety of COPCs evaluated in the BHHRA the following discussion only focuses on the contaminants that resulted in unacceptable cancer risk or nonancer hazard. For additional information please see the BHHRA.

Based on current zoning and future land use assumptions, the following current and future receptor populations and routes of exposure were considered for the various lots:

Outdoor workers are present at occupied Lots 1, 57, 59, 60, 62, 69, and 70. These receptors have the highest potential outdoor exposures, assuming they spend most of the workday outdoors conducting maintenance activities where they may be exposed to COPCs in surface soil (0 to 2 ft. bgs). Potential routes of exposure to surface soil include incidental ingestion, dermal contact, and inhalation of airborne soil particulates. Inhalation exposure of volatile COPCs released from surface and subsurface soils is also possible.

Indoor workers at occupied Lots 1, 57, 59, 60, 62, 69, and 70 spend most of the work day indoors and may be exposed via inhalation of volatile COPCs in subsurface soil (i.e., 0 ft. bgs to approximately 13 ft. bgs) and shallow groundwater due to vapor intrusion. Indoor worker exposures also include incidental ingestion and dermal contact with outdoor surface soil that has been incorporated into indoor dust.

Utility workers occasionally perform repair of underground utilities at the Site and are potentially present at occupied or unoccupied lots. The depth of underground utilities (i.e., the surface of the frost line) is typically 4 ft. These receptors are not employees at the Site, and may be on-site occasionally to repair underground utilities resulting in exposures to surface and subsurface soil (0 to 4 ft. bgs) and shallow groundwater during subsurface excavation. Potential routes of exposure include incidental ingestion, dermal contact, and inhalation of soil or groundwater vapors and airborne soil particulates.

Construction workers may be exposed at Lots 57, 58, 61, 63, 64, 68, and 70 during future development. Construction workers may be on-site for relatively short periods (up to several months) to perform building construction. These receptors may contact surface and subsurface soil and shallow groundwater during subsurface excavation. Potential routes of exposure include incidental ingestion, dermal contact, and inhalation of soil or groundwater vapors and airborne soil particulates.

Trespassers are potentially present at occupied or unoccupied lots. Adolescents/teenagers (10 to 18 years) are the most likely age group to trespass on the Site. These receptors may contact COPCs in surface soil in unpaved areas. Potential routes of exposure to surface soil include incidental ingestion, dermal contact, and inhalation of airborne soil particulates. Inhalation exposure to volatile COPCs from surface and subsurface soils is also possible while trespassers are outdoors. Adult trespasser exposures to soil were evaluated using outdoor worker exposures.

Visitors may potentially be present at the occupied lots. Child and adult visitors are on-site for short time periods during which they may contact COPCs in surface soil in unpaved areas via incidental ingestion, dermal contact, and inhalation of airborne soil particulates. Inhalation exposure to volatile COPCs from surface and subsurface soil is also possible while outdoors. Visitors may also be exposed to volatile COPCs in subsurface soil and shallow groundwater due to vapor intrusion.

Off-site workers may potentially be exposed to COPCs in on-site surface soil that migrates off-site via windblown soil vapor and particulates or on-site groundwater that might migrate off-site in the future in the small area in the northwestern corner of the Site. Off-site worker exposures were evaluated using on-site worker exposures. No site-related contamination (soil or groundwater) is known to extend off-site.

Off-site residents may be exposed to COPCs in on-site surface soil that migrates off-site via windblown soil vapor and particulates emanating from on-site areas without groundcover. The potential for this exposure is expected to be minimal for off-site residents located across McCarter Highway, which is elevated and uphill from the Site. Off-site residential exposures were evaluated using on-site future residential exposures. No site-related contamination (soil or groundwater) is known to extend off-site.

Hypothetical future resident exposures assumes medium-density residential units and hypothetical future potable use scenarios for shallow and deep groundwater. Exposure to volatile COPCs in shallow groundwater via vapor intrusion was also assessed.

For COPCs other than lead, exposure point concentrations (EPCs) were estimated using either the maximum detected concentration or the 95% upper-confidence limit (UCL) on the average concentration. Chronic daily intakes were calculated based on reasonable maximum exposure (RME), which is the highest exposure reasonably anticipated to occur at the Site. The RME is intended to estimate a conservative exposure scenario that is still within the range of possible exposures.

Lead Exposure Evaluation Process
It is not possible to evaluate health hazards from lead exposure using the same methodology as for the other COPCs because there are no published quantitative toxicity values for lead. However, since the toxicokinetics (i.e., the absorption, distribution, metabolism, and excretion of toxins in the body) of lead are well understood, lead risks are assessed based on blood lead (PbB) level, which can be correlated with both exposure and adverse health effects. Consequently, lead hazards were evaluated using blood lead models, which predict PbB levels based on the total lead intake from various environmental media. Lead hazards for non-resident adults (e.g., outdoors workers, construction workers) were assessed using the EPA Adult Lead Model (ALM). The target receptor for this model is an adult female of child-bearing age in order to protect a developing fetus. Lead hazards for children were evaluated using the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK model) . Both models estimate a central tendency (geometric mean) PbB level on the basis of average or typical exposure parameter values. Therefore, the EPCs for lead were the arithmetic mean of all the samples within the exposure area from the appropriate depth interval.

The BHHRA included an evaluation of potential cancer risks and noncancer hazards based on the chemical-specific recommendations found in literature on the chemical toxicity (e.g., EPA's Integrated Risk Information System Chemical File). Section 6.2 of the BHHRA summarizes the results of the assessments for cancer risks, noncancer hazards, and exposure to lead.

Human Health Risk Assessment Findings by Exposure Route:

Current Land Use (Section 6.2.1 of the BHHRA). Average soil lead EPCs are greater than the USEPA Region 2 nonresidential screening level of 800 mg/kg at currently occupied Lot 70 and unoccupied Lot 63. The estimated portion of the fetal PbB distribution exceeding the goal of no more than 5% of the population with PbB greater than 5 ug/dL (micrograms/deciliter) is identified for outdoor workers at Lot 70, construction workers at Lots 61, 63, 64, 68, and 70, and trespassers at Lots 63 and 70. For visitors, the estimated portion of the child PbB distribution exceeding the goal of no more than 5% of the population with PbB greater than 5 ug/dl is identified for child visitors at Lots 1, 62, and 70.

Cancer risks and noncancer hazards are within or less than the NCP risk range of 10^{-4} to 10^{-6} and below the goal of protection of a hazard index (HI) = 1, respectively.

Future Commercial/Industrial Land Use (Section 6.2.2 of the BHHRA). For exposures to COPCs in soil and groundwater, the cumulative cancer risk estimates are below or within NCP risk range.

The noncancer HIs above the goal of protection of a HI = 1 are:

- *Indoor worker* exposure to soil via vapor intrusion at Lot 58 (HI = 4 for TCE and xylenes), Lot 62 (HI = 3 for naphthalene), Lot 64 (HI = 2 for benzene and xylenes), and Lot 68 (HI = 5 for TCE)

- *Child visitor* outdoor exposure to soil at Lot 63 (HI = 3 for copper and single-chemical HI = 2 for copper)

Soil lead EPCs are greater than the USEPA Region 2 nonresidential screening level of 800 mg/kg at Lots 63 and 70. The estimated portion of the fetal PbB exceeding 5 ug/dL is greater than 5% for future outdoor workers and trespassers at Lots 63 and 70, future indoor workers at Lot 63, and future construction workers at Lots 61, 62, 63, 64, 65, 68, and 70. For future visitors, the estimated portion of the child visitor's PbB exceeding the 5 ug/dL level is greater than 5% for child visitors at Lots 1, 62, 63, 64, 65, 68, and 70.

These results remain the same for the scenario in which soil below the 0 to 2 ft. depth interval (or 0 to 4 ft. depth interval for future utility worker) is brought to the surface in the future, except for the lead hot spot analysis. A hot spot analysis identified three locations on Lot 64 (8,690 mg/kg at 1 to 3 ft. bgs, 3,080 mg/kg at 3 to 4 ft bgs. and 3,020 mg/kg at 5 to 7 ft. bgs), which are adjacent to Lot 63) that could affect the conclusions of the risk assessment for future outdoor worker exposure to lead in soil if subsurface soil is brought to the surface.

Hypothetical Future Residential Land Use and Potable

Groundwater Use (Section 6.2.2.9 of the BHHRA). A hypothetical future residential land use scenario assuming medium-density residential units was evaluated. Additionally, future hypothetical potable use of the shallow and deep groundwater was evaluated for on- and off-site workers, visitors and residents.

For outdoor exposures to surface soil, the cancer risks for the future resident exceed the NCP risk range for Lot 67 (2×10^{-4} for the future adult/child resident). For the future adult resident, the HI = 2 for Lot 63 and for the future child resident, HI ranged from 2 to 20 for all Lots except Lot 59 (HI = 1).

For soil below the 0 to 2 ft. depth interval brought to the surface, cancer risks are within or at the upper end of NCP risk range for the adult/child resident for all lots. For the adult resident, the HI = 2 for Lot 63. For the child resident, the HIs are above 1 for all properties except Lot 59, rangingfrom 2 to 20. COPCs with single-chemical cancer risks above the NCP risk range or HIs above the protection goal of HI = 1 are arsenic, benzene, TCE, PAHs, PCBs, and 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD).

For the 0 to 2 ft. interval, the soil lead EPCs are above the USEPA Region 2 residential screening level of 200 mg/kg at each property except Lots 60 and 66. For the scenario in which subsurface soil is moved to the surface during future site redevelopment, the soil lead EPCs exceed the USEPA Region 2 residential screening level of 200 mg/kg at each property except Lots 59 and 60. For the future child resident the estimated portion of the child's PbB exceeding the 5 ug/dL level is greater than 5% for soil from the 0 to 2 ft. interval at all properties except Lots 60 and 66 and for soil from all sampled depths at all properties except Lots 59 and 60.

For soil vapor intrusion exposures, cancer risks for future residents are above the NCP risk range for Lots 1, 57, 62, 64, 67, 68, and 70. HIs for both adult and child residents are above the protection goal of HI = 1 for every property except for Lots 59 and 69. For shallow groundwater vapor intrusion exposures, HIs above the goal of protection of HI = 1 were found at Lots 58 and 59 due to xylenes, using the maximum concentrations as the EPCs.

Cancer risks and HIs for future potable use of the shallow and deep groundwater are above NCP risk range and protection goal of HI = 1 for all lots. Section 6.2.2.9 of the BHHRA indicates that the COPCs with the highest single-chemical cancer risks above the NCP risk range are 1,3-dichloropropene (total), 1,2-dibromo-3-chloropropane, benzene, vinyl chloride, pentachlorophenol, benzo(a)pyrene, dibenz(a,h)anthracene, naphthalene, and arsenic. The COPCs with the highest single chemical HI are TCE, 1,2,4-trichlorobenzene, 2-hexanone, xylenes, naphthalene, cyanide, and iron.

For shallow groundwater exposure to lead, the maximum lead concentration is below the federal action level of 0.015 mg/L at each property except Lots 57, 60, 63, 64, 67, and 69. As indicated above, the Site receives drinking water from the City of Newark's potable water system.

To summarize, unacceptable noncancer health hazards were found for copper and lead in soil/fill. Naphthalene, TCE, and total xylenes are soil/fill COPCs with unacceptable risks/hazards associated with soil gas. In addition, several VOCs, SVOCs, and metals are groundwater COPCs with unacceptable risks/hazards based on hypothetical potable use scenarios.

Screening Level Ecological Risk Assessment

A SLERA was conducted and focused on the potential for terrestrial exposure from on-site surface soil/fill material. Approximately 70% of the Site is covered with impervious surfaces, such as asphalt. The remaining 30% of the Site contains pervious areas that may support potential ecological habitat. The habitat present on the Site is fragmented and of low-value to wildlife with opportunistic, invasive, and transient species, such as the Japanese knotweed, being the dominant species observed or expected to be on the property. Although groundwater under the Site discharges to the Passaic River through the sediment, there are no groundwater discharges to the surface soil/fill material; therefore, the groundwater ecological exposure pathway was determined to be incomplete for the terrestrial portion of the Site.

Primary exposure pathways include direct contact (e.g., plant roots and soil invertebrates), soil ingestion (e.g., earthworms), incidental soil ingestion (e.g., preening by birds), and ingestion of soil invertebrates and small mammals. For wildlife, prey ingestion is assumed to dominate exposure. Due to the limited, fragmented, and low-quality ecological habitat available on-site and the proximity to active industrial and commercial operations, it is unlikely that federal-listed or state-listed sensitive species would be present on-site. The likely future use of this Site is to remain developed for commercial/industrial purposes and redevelopment of any portion of the Site will remove or alter the existing ecological resources in that area.

WHAT IS ECOLOGICAL RISK AND HOW IS IT CALCULATED?

A Superfund baseline ecological risk assessment is an analysis of the potential adverse health effects to biota caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current and future land and resource uses. The process used for assessing site-related ecological risks includes:

Problem Formulation: In this step, the contaminants of potential ecological concern (COPECs) at the site are identified. Assessment endpoints are defined to determine what ecological entities are important to protect. Then, the specific attributes of the entities that are potentially at risk and important to protect are determined. This provides a basis for measurement in the risk assessment. Once assessment endpoints are chosen, a conceptual model is developed to provide a visual representation of hypothesized relationships between ecological entities (receptors) and the stressors to which they may be exposed.

Exposure Assessment: In this step, a quantitative evaluation is made of what plants and animals are exposed to and to what degree they are exposed. This estimation of exposure point concentrations includes various parameters to determine the levels of exposure to a chemical contaminant by a selected plant or animal (receptor), such as area use (how much of the site an animal typically uses during normal activities); food ingestion rate (how much food is consumed by an animal over a period of time); bioaccumulation rates (the process by which chemicals are taken up by a plant or animal either directly from exposure to contaminated soil, sediment or water, or by eating contaminated food); bioavailability (how easily a plant or animal can take up a contaminant from the environment); and life stage (*e.g.*, juvenile, adult).

Ecological Effects Assessment: In this step, literature reviews, field studies or toxicity tests are conducted to describe the relationship between chemical contaminant concentrations and their effects on ecological receptors, on a media-, receptor- and chemical-specific basis. To provide upper and lower bound estimates of risk, toxicological benchmarks are identified to describe the level of contamination below which adverse effects are unlikely to occur and the level of contamination at which adverse effects are more likely to occur.

Risk Characterization: In this step, the results of the previous steps are used to estimate the risk posed to ecological receptors. Individual risk estimates for a given receptor for each chemical are calculated as a hazard quotient (HQ), which is the ratio of contaminant concentration to a given toxicological benchmark. In general, an HQ above 1 indicates the potential for unacceptable risk. The risk is described, including the overall degree of confidence in the risk estimates, summarizing uncertainties, citing evidence supporting the risk estimates and interpreting the adversity of ecological effects.

Based on the results of the SLERA, the primary terrestrial ecological pathway is contaminated surface soil/fill material. The SLERA identified this pathway as being related to unacceptable ecological risk. Chemicals of potential ecological concern (COPECs) identified in surface soil included several VOCs, PAHs and other SVOCs, one pesticide (heptachlor epoxide), PCBs, dioxin, and several metals. These compounds were identified using stringent comparison values and given the lack of quality habitat the overall ecological risk is overestimated in the SLERA. In lieu of conducting an additional, more in-depth ecological evaluation for the Site, EPA has made a management decision to consider risk-based concentrations that are protective of ecological receptors in the selection of preliminary remediation goals to ensure that the remedial alternatives will address the potentially unacceptable ecological risks identified in the SLERA.

Based upon the results of the RI and risk assessments, EPA has determined that the Preferred Alternative or one of the other active measures considered in the Proposed Plan is necessary to protect public health, welfare, and the environment from actual or threatened releases of hazardous substances from the Site.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) advisories, criteria and guidance, and site-specific risk-based levels.

The following RAOs were established for the Site for contaminants of concern (COCs):

Waste

- Secure or remove wastes that act as a source of COCs to other media to the extent practicable.
- Prevent uncontrolled movement of COCs in wastes (i.e., spills and free-phase liquid) that may impact other media.
- Minimize or eliminate human and ecological exposure to NAPL.

Sewer Water

- Prevent exposure to COCs in sewer water and solids associated with a release from the inactive sewer system.
- Minimize concentrations of COCs in sewer water (inactive system).

- Prevent or minimize discharge of sewer water COCs to surface water to minimize the potential for interaction between the Site and the Passaic River.

Soil Gas

- Minimize contaminant levels in sources of COCs in soil gas that may migrate to indoor air.

Soil/Fill

- Remove COCs or minimize COC concentrations and eliminate human exposure pathways to COCs in soil and fill material.
- Remove COCs or minimize COC concentrations and eliminate or minimize ecological exposure pathways to COCs in soil and fill material.
- Prevent or minimize offsite transport of soil containing COCs to minimize the potential for interaction between the Site and the Passaic River.
- Prevent or minimize potential for leaching of COCs to groundwater and surface water from soil and fill.

Groundwater

- Minimize contaminant concentrations and restore groundwater quality.
- Prevent exposure to COCs in groundwater.
- Prevent or minimize migration of groundwater containing COCs.
- Prevent or minimize discharge of groundwater containing COCs to surface water to minimize the potential for interaction between the Site and the Passaic River.

PRELIMINARY REMEDIATION GOALS

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

[4] RBCs for human health and ecological receptors are derived for each risk driver/receptor scenario identified in the BHHRA and SLERA as posing risk/hazard in excess of EPA acceptable levels.

Ex. 5 Deliberative Process (DP)

CERCLA Section 121(b)(1), 42 U.S.C. § 9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives, to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a Site. CERCLA Section 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. § 9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the Site can be found in the FS Report. Since contamination would be left on the Site above levels that allow for unlimited use and unrestricted exposure for certain media, five-year reviews would be conducted to monitor the contaminants and evaluate the need for future actions. Capital costs are based on Year 2020 dollars. Present worth assumes that construction would begin in 2022 and assumes a 7 percent discount rate.

Waste Alternative 1: No Action

Capital Cost:	$0
Annual OM&M Cost:	$0
Present Worth Cost:	$0
Construction Time:	0 months

Under this alternative, no action would be taken. This alternative is retained for comparison with the other alternatives as required by the NCP. Under no action, remaining source materials at the Site would be left in place, and no means of securing the materials to prevent future release to the environment would be implemented.

Waste Alternative 2: Removal and Off-Site Disposal

Capital Cost:	$1,798,211
Annual OM&M Cost:	$0
Present Worth Cost:	$1,580,700
Construction Time:	1-2 months

This alternative focuses on removal of principal threat waste along with removal of the various small, volume wastes found across the Site to prevent an uncontrolled release to the environment. This alternative includes the removal of chalky talc-looking substance in Building #7, the plastic 55-gallon drum in Building #12, a five-gallon bucket in Building #17, the USTs on Lot 64, the waste and LNAPL within the USTs, NAPL-impacted soil/fill material surrounding the USTs, and the LNAPL in the pooled water in Building #15A, These wastes will then be properly disposed. The LNAPL in the USTs and Building #15A are considered principal threat wastes, and the removal and disposal of these wastes will address this concern.

Upon removal of USTs and their contents, confirmation soil/fill (including underneath the tank) and groundwater sampling will occur consistent with substantive requirements of New Jersey tank closure regulations and NJDEP Technical Requirements (N.J.A.C. 7:26E-5.1(e)).

Contaminated soil/fill and groundwater observed in the excavation after tank removal would be addressed in accordance with substantive requirements of New Jersey tank closure regulations and NJDEP Technical Requirements found at N.J.A.C. 7:26E-5.1(e). It is assumed that approximately 3,500 CY of NAPL-impacted soil/fill adjacent to the USTs would require excavation and off-site disposal as part of this alternative. It is anticipated that excavation will extend 13 feet bgs. Note that removal of NAPL-impacted soil/fill on Lot 63, not directly associated with UST removal on Lot 64, is addressed in the soil/fill alternatives.

The total volume of liquid waste estimated to be removed for off-site disposal is approximately 39,000 gallons: consisting of 55 gallons of waste from Buildings #12 and #17; 2,900 gallons of LNAPL in Building #15A; 1,600 gallons of LNAPL in the UST; and 34,700 gallons of water in the six USTs. The total volume of solid waste estimated to be removed is approximately 3,511 CY: consisting of 11 CY in Building #7 and 3,500 CY of NAPL-impacted soil/fill associated with the UST removal and closure.

Sewer Water Alternative 1 – No Action

Capital Cost:	$0
Annual OM&M Cost:	$0
Present Worth Cost:	$0
Construction Time:	0 months

Under this alternative, no action would be taken. This alternative is retained for comparison with the other alternatives as required by the NCP. Under no action, the water and solids in the designated section of sewer and associated line would be left in place, and no means of securing the materials to prevent future release to the environment would be implemented.

Sewer Water Alternative 2 – Removal and Off-Site Disposal

Capital Cost:	$27,981
Annual OM&M Cost:	$0
Present Worth Cost:	$24,900
Construction Time:	1 months

This alternative consists of transferring the sewer water and solids (approximately 0.75 CY) from the inactive sewer line into appropriate containers or transport vehicles for off-site treatment and/or disposal along with proper closure of the line. Liquid materials would be pumped into drums and transferred to an appropriate facility for treatment and disposal. Remaining solids in the manhole would be placed into a drum and disposed in an appropriate solid waste landfill.

Upon removal of the contents, the interior of the manhole and associated line would be water-jetted, and then closed in place by plugging/filling to prevent future buildup of water and solids in the manhole. Cleaning of the manhole and the one unplugged pipe (estimated to be 125 liner feet) would generate an estimated 3,000 gallons of additional liquid.

Soil Gas Alternative 1 – No Action

Capital Cost:	$0
Annual OM&M Cost:	$0
Present Worth Cost:	$0
Construction Time:	0 months

Under this alternative, no action would be taken. This alternative is retained for comparison with the other alternatives as required by the NCP. Under no action, no measures would be taken to protect future indoor workers from exposure to soil vapors.

Soil Gas Alternative 2 – Institutional Controls, Air Monitoring or Engineering Controls (existing occupied buildings) and Site-Wide Engineering Controls (future buildings)

Capital Cost:	$123,525
Annual OM&M Cost:	$31,500
Present Worth Cost:	$449,800
Construction Time:	1-2 months

This alternative consists of establishing or enhancing deed notices and/or CEAs site-wide to provide notice of certain restrictions upon the use of the property and groundwater.

Ex. 5 Deliberative Process (DP)

[5] Soil/Fill Alternative 2 includes institutional controls and NAPL removal but was screened out and not included in this Proposed Plan because it did not comply with ARARs and is not eligible for selection.

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

precipitation (chemical), and carbon polishing, was assumed. The flow rate through the treatment system would be appropriately adjusted during periods of in-situ treatment to promote remediation. Approval would be sought for discharge of treated water to the local POTW or surface water.

As with Groundwater Alternative 3, the extent of groundwater to be addressed by periodic in-situ applications and the specific means for addressing it would be determined during the remedial design, including additional groundwater sampling and the performance of treatability studies. For costing purposes, this alternative assumes targeted, periodic in-situ applications would occur annually during the first five years of operation, and the effectiveness of the various approaches would be evaluated and modified, as needed, between each event. Under this hybrid approach, periodic in-situ remediation would be focused on the upgradient portion of the Site, targeting contaminated areas in both the shallow and deep groundwater. During the periodic injections, pumping at upgradient wells could be temporarily reduced or halted, as appropriate to give the amendments adequate contact time with COCs in the groundwater. In any area where in-situ treatment did not achieve PRGs, regardless of the location on-site, pump and treat would be relied upon to achieve the remedial objectives. To prevent uncontrolled release of injection fluids into the river, injection wells along the river may not be a viable option.

COMPARATIVE ANALYSIS OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely, overall protection of human health and the environment, compliance with applicable or relevant and appropriate requirements, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance. Seven of the nine evaluation criteria are discussed below. The final two criteria, "State Acceptance" and "Community Acceptance" are discussed at the end of the document.

<u>Overall protection of human health and the environment</u> addresses whether an alternative provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with ARARs addresses whether an alternative would meet all the applicable or relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.

Long-term effectiveness and permanence refer to the ability of an alternative to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

Reduction in toxicity, mobility, or volume (TMV) through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

Short-term effectiveness addresses the time needed to achieve protection and any adverse impacts on the community and workers, and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

Implementability is the technical and administrative feasibility of an alternative, including the availability of materials and services needed to implement a particular option.

Cost includes estimated capital and OM&M costs, and net present worth costs, calculated using a 7% discount rate.

State acceptance indicates if, based on its review of the RI/FS and Proposed Plan, the state concurs with the preferred alternative at the present time.

Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports.

The following is a comparative analysis of the alternatives for each medium, based upon the evaluation criteria noted above.

Waste

Accordingly, it will not be carried through the remaining criteria analysis.

Waste Alternative 2 (removal and off-site disposal) would provide protection of human health and the environment, as the wastes (and principal threat waste) would be removed from the Site, thereby eliminating the potential for exposure of human and ecological receptors and release of the materials to environmental media.

Compliance with ARARs
Waste Alternative 2 would be implemented in compliance with location-specific ARARs, such as the substantive requirements of New Jersey UST closure regulations and NJDEP Technical Requirements (N.J.A.C. 7:26E-5.1(e)) and to treat or remove free product.

Long-term Effectiveness and Permanence
Waste Alternative 2 would achieve long-term effectiveness through the removal and off-site disposal of waste, including principle threat waste identified on Lot 64.

Reduction of TMV through Treatment
TMV may be reduced in Waste Alternative 2 if material is treated to comply with disposal requirements, as required by the disposal facility.

Short-Term Effectiveness
Waste Alternative 2 would be implemented within one month, so any short-term impacts to the surrounding community and environment will be minimal.

Implementability
Removal of the wastes and USTs is readily implementable, as equipment and experienced vendors for this type of work are available along with backfill material and disposal facilities.

Cost
The present worth cost for each of the Alternatives is:

Waste Alternative 1 - $0
Waste Alternative 2 - $1,580,700

Sewer Water

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Disposal
- Sewer Water Alternative 2 – Removal and Off-Site Disposal
- Soil Gas Alternative 2 – Institutional Controls, Air Monitoring or Engineering Controls (existing occupied buildings), and Site-Wide Engineering Controls (future buildings)
- Soil/Fill Alternative 4 – Institutional Controls, Engineering Controls, Focused Removal with Off-Site Disposal of Lead, and NAPL Removal
- Groundwater Alternative 4 – Institutional Controls, Pump and Treat, and Targeted Periodic In-Situ Remediation

Waste

The preferred waste alternative includes removal of various wastes found across the Site and disposing them off-site. The wastes identified in this preferred alternative include:

- Approximately 34,700 gallons of water and 1,600 gallons of LNAPL within the six USTs located north of Building #12 on Lot 64
- Excavated NAPL-impacted soil/fill material following UST removal (approximately 3,500 CY)
- The six tanks in the UST area
- Approximately, 2,900 gallons of LNAPL pooled under a steel grated floor in Building #15A
- 11 CY of a white chalky talc-looking substance in a hopper in Building #7
- 50 gallons of liquid waste in a plastic drum in Building #12
- A five-gallon bucket of a waste labeled as a filler in Building #17

This preferred alternative would provide the greatest protection of human health and the environment and long-term effectiveness because removing the waste will prevent an uncontrolled release into the environment. In removing this waste, all ARARs will be complied with.

Furthermore, removing the USTs and addressing the LNAPL in the USTs and the NAPL-impacted soil/fill surrounding the USTs will eliminate the principal threat waste.

The preferred waste alternative also improves the effectiveness of the groundwater alternatives with respect to organics. Removal of the USTs and their contents along with the LNAPL and NAPL-impacted soil/fill material will also remove a potential groundwater source. This action is expected to result in improved groundwater quality with respect to VOCs and may reduce the scope/footprint and time needed to achieve certain groundwater chemical-specific ARARs.

Sewer Water

The preferred sewer water alternative includes removal of sewer water and associated solids from an inactive portion of the northern sewer line (known as Manhole 8) on Lot 1. These wastes will then be properly disposed off-site.

This preferred alternative is expected to provide the greatest protection of human health and the environment and long-term effectiveness because removing the sewer water and solids will prevent an uncontrolled release into the environment. In removing this material, all ARARs will be complied.

Soil Gas

Ex. 5 Deliberative Process (DP)

Soil

Ex. 5 Deliberative Process (DP)

Building #7, which is predominantly located geographically on Lot 63 and Lot 64. This alternative would reduce mobility of COC on-site through removal and off-site disposal of not only lead but also co-located contaminants. The alternative also addresses the deteriorating portions of the bulkhead to minimize the potential for interaction between the Site and surface water and to minimize soil erosion. The site-wide cap would also prevent access and contact with the contaminated media and/or to control contaminant migration. Impermeable caps, like asphalt caps, also address the soil-to-groundwater pathway by reducing vertical infiltration. Soil/fill with NAPL on Lot 63 will be excavated and disposed off-site.

The preferred soil alternative provides the best overall protection of human health/environment and compliance with ARARs while also being relatively easily to implement. Soil/Fill Alternative 5 (in-situ treatment) provides reduction of toxicity and mobility through treatment (which the preferred soil alternative does not) and is comparable to the preferred alternative for long-term effectiveness and permanence, but with respect to short-term effectiveness and implementability Soil/Fill Alternative 5 does not compare favorably. Soil/Fill Alternative 5 treatment areas in the northern portion would cause significant disturbances to businesses, as reagent delivery to the subsurface would require the use of either large diameter augers, which may not be feasible due to underground utilities, and closely spaced injection points, due to the relatively shallow depth of impacts. While Soil/Fill Alternative 3 would eliminate contact with soil/fill at concentrations exceeding ARARs through capping, the preferred soil alternative would offer better overall protection and compliance with the ARARs since, in addition to capping, lead contaminated soil/fill around Building #7 (along with col-located contamination) would be removed from the Site.

Furthermore, the preferred soil/fill alternative also improves the effectiveness of the groundwater alternatives with respect to organics and metals. First, removal of the NAPL-impacted soil/fill material on Lot 63 and the lead-impacted soil/fill material around Building #7 will also remove a potential groundwater source. This action is expected to result in improved groundwater quality with respect to VOCs and Lead and may reduce the scope/footprint and time needed to achieve certain groundwater chemical-specific ARAR. In addition, the proposed site-wide cap in the soil/fill alternative will limit the amount of surface water infiltrating through the soil/fill and impacting groundwater.

Groundwater

The preferred groundwater alternative includes the installation of a site-wide pump and treat system, and a targeted, periodic in-situ treatment approach in upgradient portions of the Site. Ongoing groundwater monitoring would be performed to demonstrate that the selected remedy continues to be protective of human health and the environment. The pumping wells near the river would be located to provide hydraulic containment at the river's edge to capture groundwater COCs at concentrations exceeding ARARs. The targeted, periodic in-situ applications would occur annually, and the effectiveness will be evaluated and modified, as needed, between each event.

The preferred groundwater alternative provides the best overall protectiveness, compliance with ARARs, long-term effectiveness, and reduction of toxicity, mobility and volume through treatment. Groundwater Alternatives 2 (river barrier and pump and treat only) and 3 (in-situ only) provide less long-term effectiveness and permanence, due to their sole reliance on either pump and treat or in-situ applications as singular components, which will likely extend the timeframe to meet PRGs, achieving the goal of groundwater restoration.

Basis for the Remedy Preference

The Preferred Alternative is believed to provide the best balance of tradeoffs among the alternatives based on the information available to EPA at this time. EPA believes the Preferred Alternatives would be protective of human health and the environment, would comply with ARARs, would be cost-effective, and will utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. The Preferred Alternative may change in response to public comment or new information. The total present worth cost for all the Preferred Alternatives is $38,923,100.

Because the Preferred Alternative would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, CERCLA would require that the Site be reviewed at least once every five years.

Consistent with EPA Region 2's Clean and Green policy, EPA will evaluate the use of sustainable technologies and practices with respect to implementation of a selected remedy.

State Acceptance

The Proposed Plan is currently under review by NJDEP.

Community Acceptance

Community acceptance of the Preferred Alternative will be addressed in the ROD following review of the public comments received on this Proposed Plan.

For further information on Riverside Industrial Park Superfund Site, please contact:
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Shereen Kandil
Community Relations Coordinator
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Kandil.shereena@epa.gov

Information can also be found on the web:
[HYPERLINK "http://www.epa.gov/superfund/riverside-industrial"]

The public liaison for EPA Region 2 is:
George H. Zachos
Regional Public Liaison
Toll-free (888) 283-7626, or (732) 321-6621
U.S. EPA Region 2

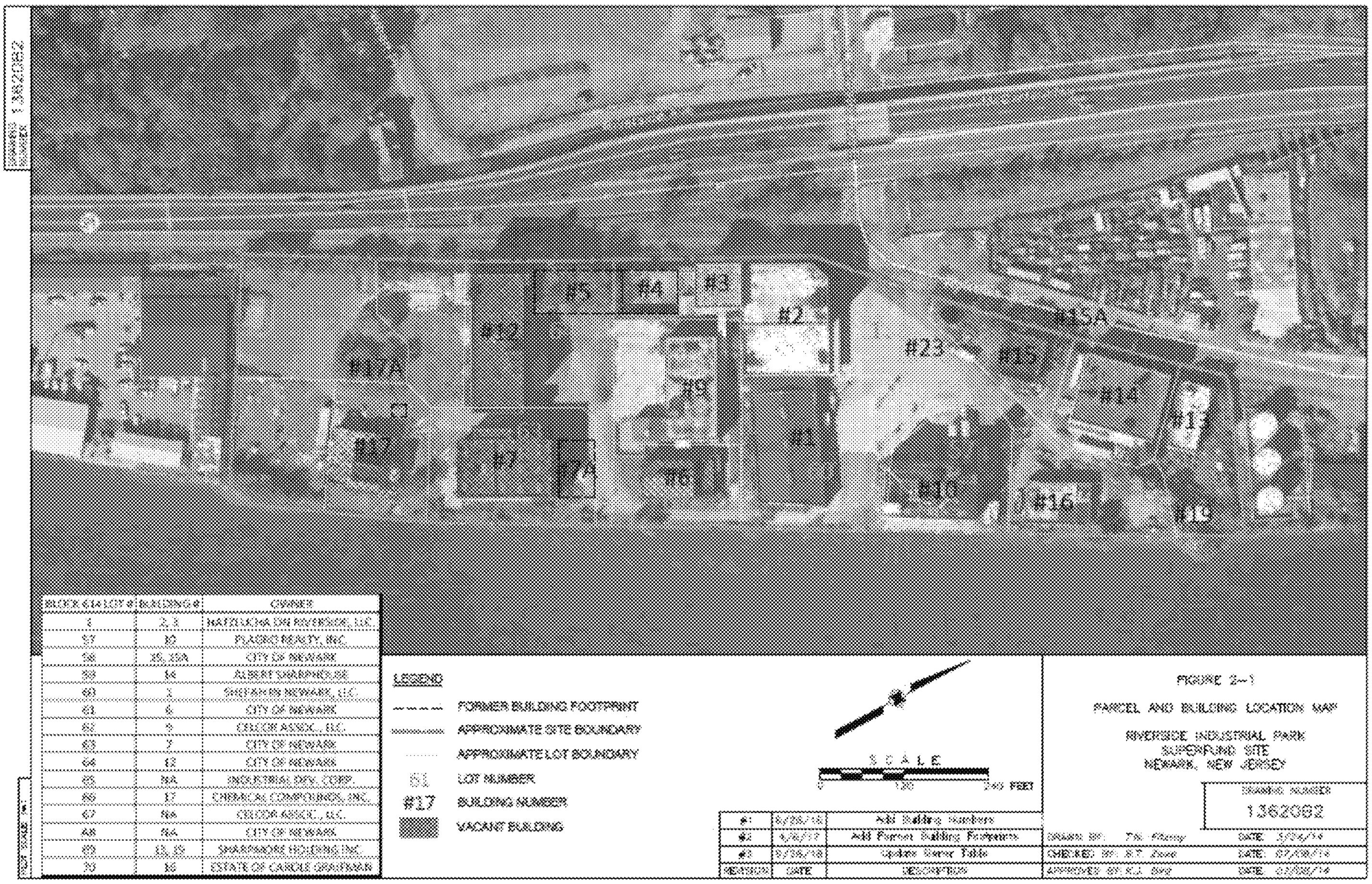

Figure 1: Map of Riverside Industrial Park Superfund Site

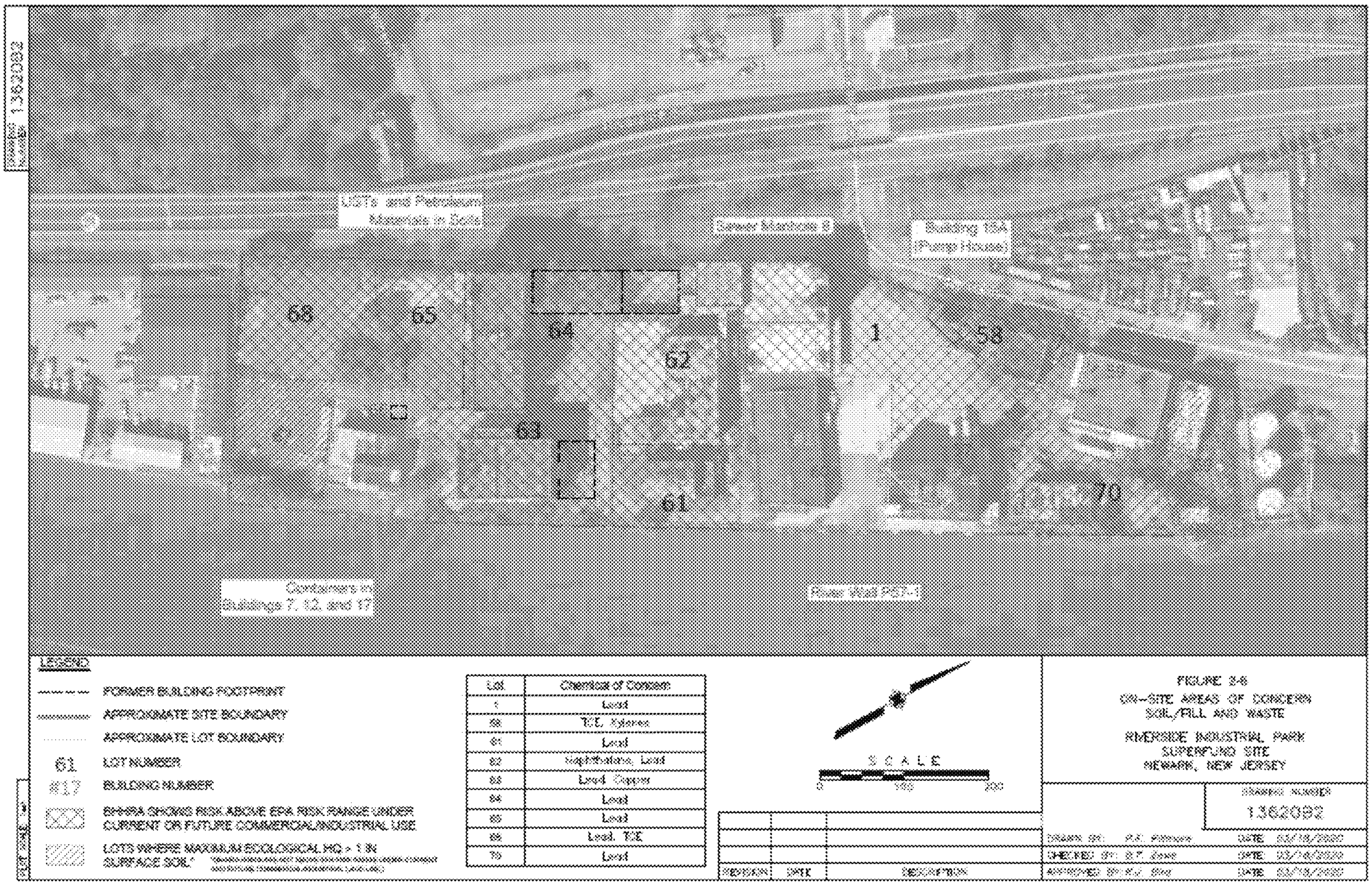

Figure 2: Map of Areas of Concerns for the Site

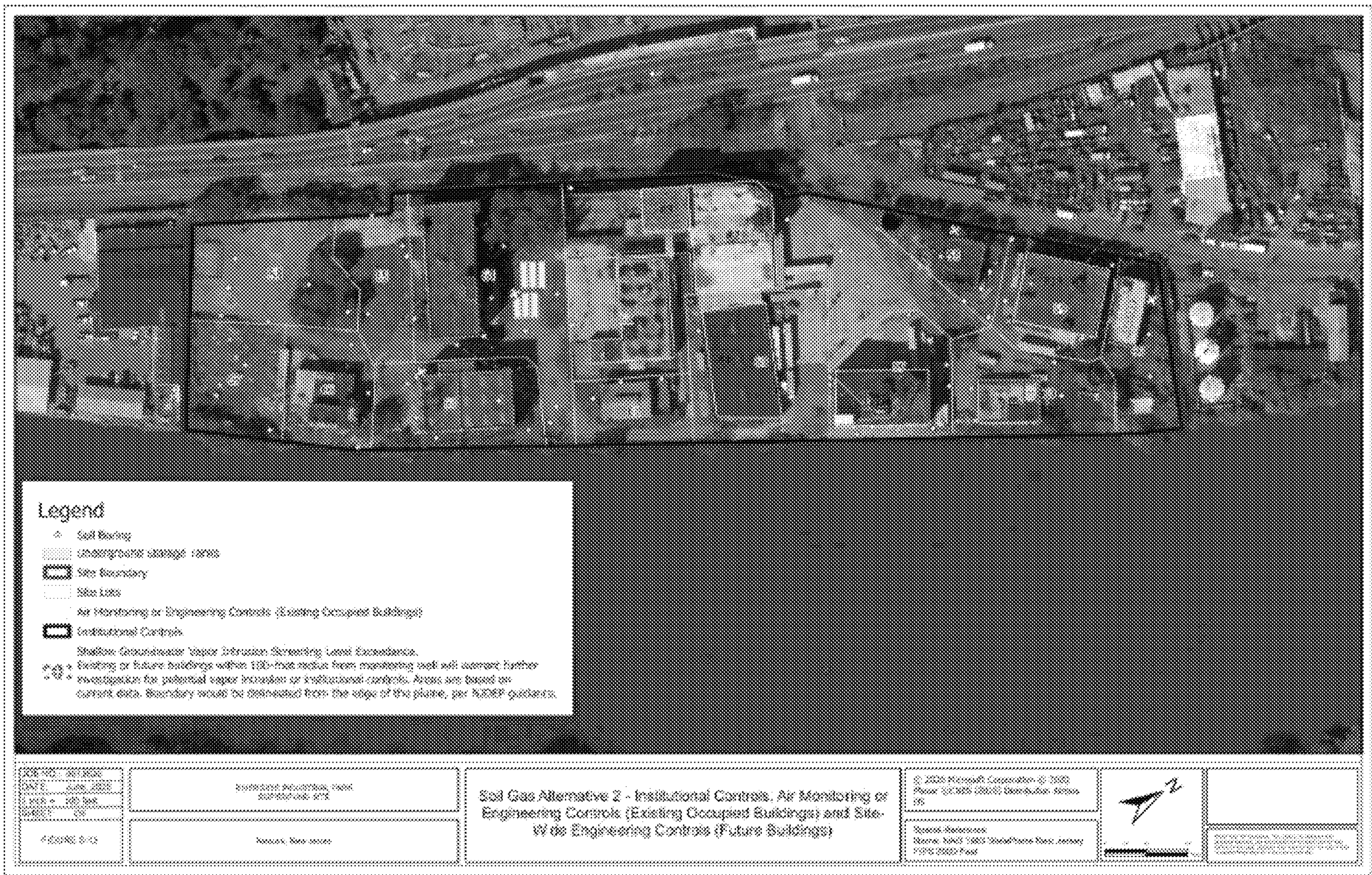

Figure 3: Map of Preferred Soil Gas Alternative

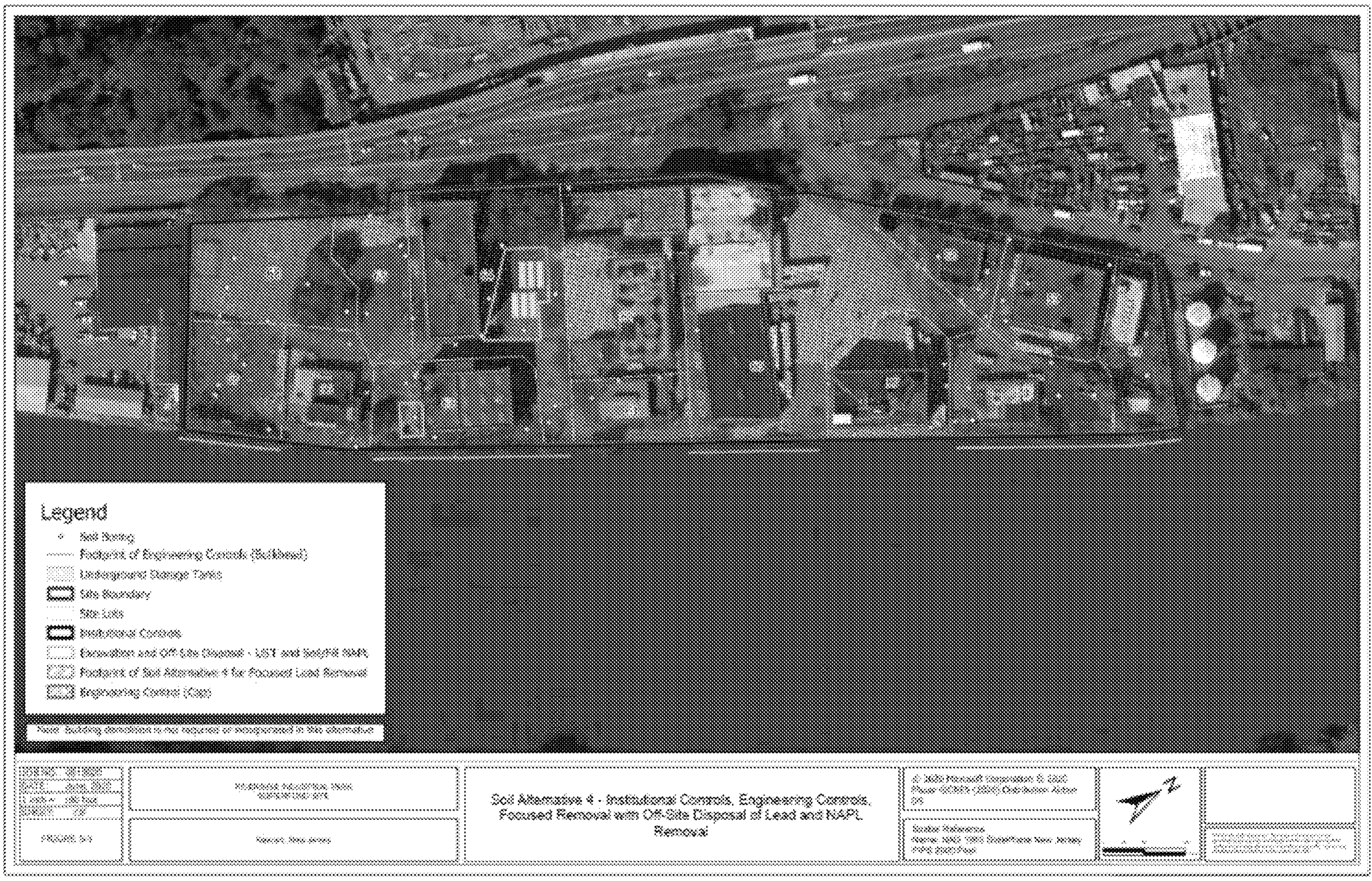

Figure 4: Map of Preferred Soil/Fill Alternative

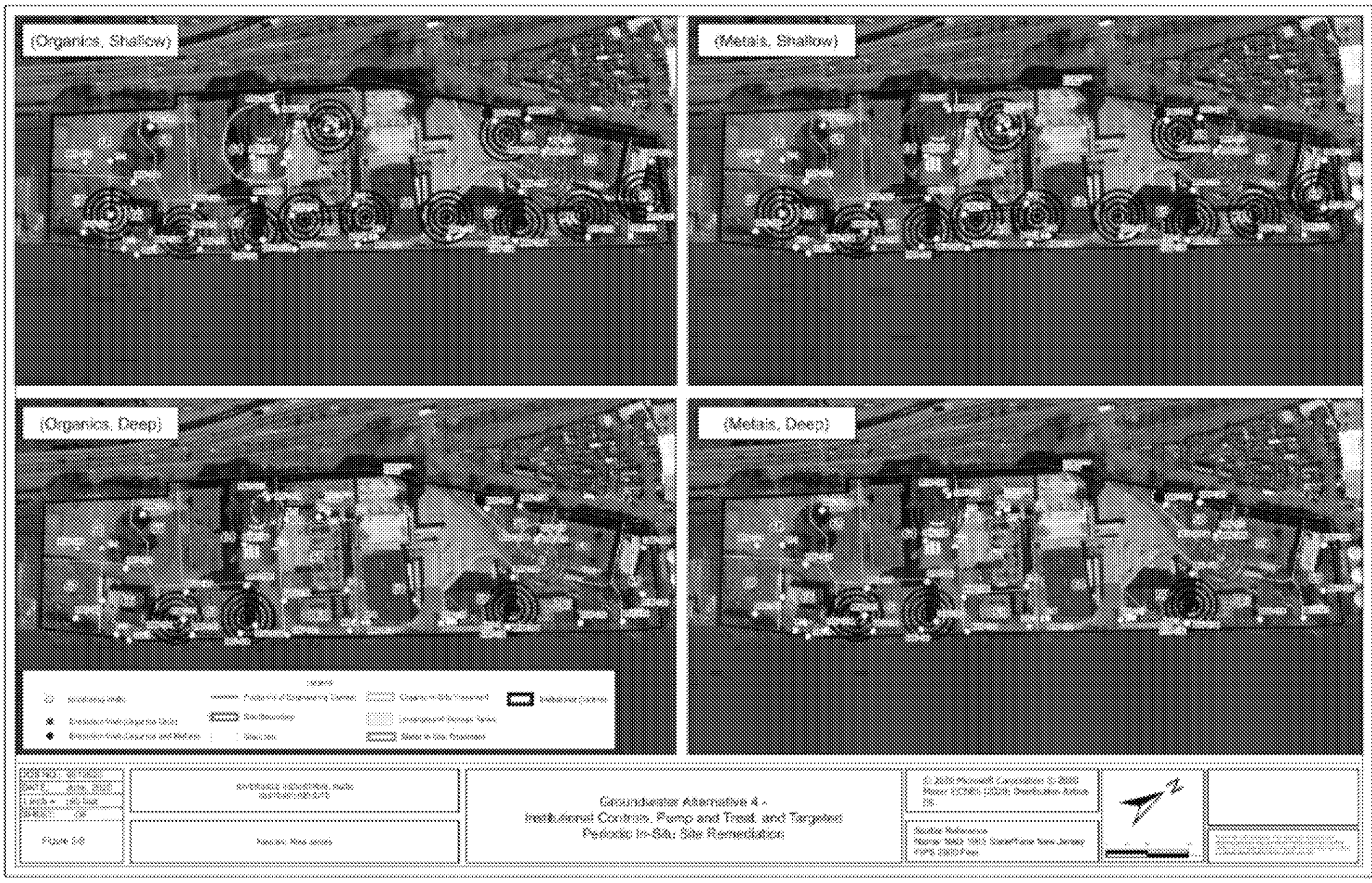

Figure 5: Map of Preferred Groundwater Alternative